

# Integration of Environmental Consideration in Local and Regional Development Process: the Case of the 2nd Industrial Estate Development Project of Iri, Korea

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## **I. Introduction**

The institutional framework for environmental consideration in local and regional development has been in operation only since early 1980s in Korea, when the new Environmental Preservation Law was enacted. The main instrument is the Environmental Impact Assessment system; and the organizational responsibility rests with the Office of Environment which was established in late '70s.

Societal recognition of the needs for environmental protection preceded the institutional framework. However, the rationale for "first growth and then environmental protection", especially among the central government's resource planners, has persisted very long. To quote a former economic planner in the government, "pollution of under-development" had to be dealt with as more urgent problem than the "effluents of development." Especially

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when the issue is raised with respect to the needs of development of an economically lagging region, economic growth via industrialization in the most efficient way has been deemed imperative not only by the government planners but also by most of the people in the region.

At the same time societal perception of the needs of environmental protection has also long been rather ambiguous and even confusing at times. Some perceived it in terms of growth versus ecological balance, while others were merely complaining the congestion and dirty air in larger cities.

It is in the context of societal recognition of the broader needs of development such as distributional equity, welfare, quality of education and health that the need of environmental protection has begun to be recognized since early '80s by government planners as well as by citizenry in general. Responding to the changing perception, the Korean government even changed the name of the fifth 5-Year Development Plan to the Fifth 5-Year "Socio-Economic" Development Plan from the previous "Economic Development" Plan.

Despite such conceptual changes and institutional preparation, however, the operational process of environmental management, especially in the fields of local and regional development, is still in an infant stage. Technical know-hows, administrative procedures, national and local political leadership, community organization and resources are still very much lacking for a satisfactory level of environmental management and protection. This study is to describe such operational aspects of environmental management by focusing on a case of industrial location decision-making process for a city in the North Cholla Province of Korea against the background of the past 20 years of national development process.

## II. Historical Overview of National Development Strategies

Since the end of Korean War the primary concern of national development has been economic growth. Per capita income growth has been *the* single most important indicator of national development for the past 20 to 30 years; and industrialization has been the main avenue of development process.

Per capita income in Korea at the end of the War was a meager \$80. Virtually everything of economic significance, most of industrial production facilities and urban infrastructures, were destroyed by the War. It has been estimated "that the overall physical

destruction attributable to the war was the equivalent of \$2 billion, that is, roughly equal to the value of one year's Gross National Product at that time".<sup>(1)</sup>

Under the circumstances rapid economic growth was imperative. Industrialization was believed by almost a national consensus as the only way for such an urgent growth. A sudden increase of population including millions of North Korean refugees, scarcity of natural resources including land, and primitiveness of farming technology persuaded nobody to believe that agriculture could be the spearhead sector of national development, despite the fact that the South had traditionally been the breadbasket of the nation.

On the other hand, human resource of the abundant population was considered as relatively highly developed asset for industrialization. According to a study, Korea's human resource development, "based on conditions in the late 1950s using formal education as a measure," "was comparable to that of countries with median per capita GNP equal to three times the Korean level" then<sup>(2)</sup>.

However, a systematic and concerted effort of national development planning on industrialization did not begin until 1962. From 1953 when ceasefire was entered in the War through 1958, rehabilitation and reconstruction of war damages was the main concern. Foreign aid was the main source of finance and investments for most of the projects of any significance during this period. Following this period of reconstruction and rehabilitation, there was a period of two to three years of political unrest and economic stagnation.

Hence, 1962 was officially the first year of *national* development planning of industrialization process to be followed by five 5-Year Economic Development Plans thus far. And this was also the beginning of development process characterized by high growth of GNP and of structural changes in the economy in the form of relatively higher shares of growth in the secondary and tertiary sectors and lower shares in the primary sector. Since 1963 the per capita GNP has steadily grown at an average annual rate of 7.5 percent.<sup>(3)</sup>

Agriculture, forestry and fisheries declined "from nearly half of GNP in 1954 to less than one-third by 1967~1968. During the same period, mining and manufacturing rose from less than 10 percent to nearly one-fourth and social overhead from below 5 percent to over 10 percent."<sup>(4)</sup>

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(1) Cole, David C. & Lyman, Princeton N.J., *Korean Development: The Interplay of Politics and Economics*, Harvard Univ. Press, 1981, p.123.

(2) Ibid., p.138.

(3) Song, Bung-Nak, *Korean Economy*, Bak Yung Sa, 1981, p.281.

(4) Cole, David C. & Lyman, Princeton N.J., op. cit., p.125.

Although more or less the same pattern of development process continued for approximately ten years through two consecutive Five-Year Plans, relative emphasis of investment decisions has changed from one period to another. The first Five-Year period allocated relatively more money to the social overhead sectors, which has been most heavily destroyed by the war and deprived by partition of the country, and to the industries for import substitution of so many consumer goods and services that had been totally dependent upon foreign productions. While during the second Five-Year period, relatively wider range of programs and projects were brought into the purview of planned investment decisions. If the first Five-Year Plan is to be characterized as strictly government controlled, selective investments decisions for a few urgently needed infrastructure projects, the second 5-Year Plan can be defined as the first comprehensive, "resource planning" for the industrial sectors as a whole.<sup>(5)</sup>

Throughout the 10 year period, however, the overriding concern that remained unchanged in both Plans was the fastest possible aggregate GNP growth. Although the stated objectives of the two Plans appeared slightly different in the manner that the Second 5-Year Plan for the first time proposed to diversify agriculture and make efforts to increase farm income, the overall strategies did not change much through the 10 year period: it was basically centrally (the central government's Economic Planning Board) planned and government controlled process of investments decisions in favor of fastest growing sectors of industry. Any serious efforts for the agricultural sectors were not made in fact until early 1970s when the Third 5-Year Plan was in force. It was during this 10 year period that the first major scale petro-chemical industrial complex was built at Ulsan, previously a small fishing village southwest corner of the country.

The Third 5-Year Economic Planning period beginning 1972 was a sort of conceptual turning point in the Korean national development process. It was during the plan formulation as well as in subsequent years of the plan implementation that increasing demands for social development in various aspects of human welfare began to be made to the policy-makers.<sup>(6)</sup> The realization that higher level of national income and production does not automatically bring about correspondingly higher level of human welfare for all was spreading widely and at the same time, as the economy grew larger in size and greater

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(5) Jo, Sung-Hwan & Park, Seong-Yawng, Basic Documents and Selected Papers of Korea's Third Five-Year Economic Development Plan, Sogang Univ. Press, 1972, pp.19-21.

(6) Song, Byung-Nak, op. cit., pp.274-275.

in complexity, the command-style central planning and implementation became more and more difficult.

Thus, the Third 5-Year Plan took the form of more or less an indicative planning, opening the gate for more private sectors initiatives and participation in the development process. And it was also during this period that the first 10-Year National Territorial Development Plan was formulated and officially sanctioned as the national policy guidelines for urban and regional development planning. Large scale industrial estates for heavy machinery, petro-chemical, and electronics industries were developed at several locations outside of Seoul metropolitan region; and the major north-south axis of expressway linking most of the major urban centers was also planned and built during this period. The last but not the least important feature of this period was the nationwide launching of what is so well known now as the "Saemaul Undong" (New Community Movement) for the so far neglected farm villages of Korea. Perhaps this may be cited as indeed the single dominant feature of socio-economic development effort of the Third 5-Year Plan. All in all during this period the Korean economy began to show some semblance of modern system both in its technology of production and in infrastructures.

Not mere lip service but real actions, however, on the non-economic aspects of the national development process came by only in the late 70s and early 80s when the 4th and 5th planning process was in progress. A wide range of regulatory measures to check further population concentration in the capital region were formulated and implemented beginning 1978; a new Office of Environment was established in 1979 and the national government budget allocation for the environmental protection administration made a quantum jump in amount in that year; a comprehensive program for the urban poor was incorporated into the 5th Five Year Plan; extension of compulsory education from up to sixth grade to ninth grade has been decided to be completed by 1991 starting in 1984 from lower income regions; national medical insurance system has been instituted and to be expanded; the 2nd 10-Year National Territorial Development Plan has also been prepared and finally, local government autonomy is currently under study to be at least partially put in force in 1987. Perhaps to give a symbolic meaning to all these changes in the national development strategies, the national government has officially named the current 5th Five Year Plan as the 5th Socio-Economic Development Plan for the first time.

### III. Regionalization of Economic Development

#### 1. The Needs and Constraints of Regional Development

The needs of regional development began to be felt in Korea beginning late 1960s and early '70s. Societal recognition of the needs began to be articulated in terms of income disparities among different regions; and interregional population migrations from rural to urban and from poorer to richer regions were perceived as concomitant problems of the regional income disparities.

Statistical analysis of the conditions shows that by 1967 the coefficient of variation of regional income disparities jumped to 41.6 from that of 25.9 in 1963.<sup>(7)</sup> Statistics also show that the difference of per capita gross regional product between the highest income region (Seoul) and the lowest income region (Kyung Nam Province in 1963; Cholla Nam Province 1967) worsened between 1963 and 1967 from a double to a triple size. As far as the figures of coefficient of variations are concerned, the late 60s were the worst years and it has slowly gotten better to 30.2 in 1970, 22.9 in 1975 and 21.2 in 1978.

Some attribute this progressive trend since early '70s to the government's policy of price support of the agricultural products.<sup>(8)</sup> Beyond mid-70s, however, not only the price support policy but also the comprehensive rural community development programs of Saemaul Undong may very well be credited for it.

Whatever may have been the causes of such a salutary trend, popular perception of interregional inequities do not seem to have changed very much since 1960s. Interregional migration from rural communities to urban centers and also from smaller cities to larger cities, Seoul being at the top, is still continuing. In fact during the period from 1970 through 1980, for the first time four provinces, basically agricultural, began to show minus figures in the average annual population growth rate while Seoul's share of the total national population has constantly grown from 17.6% in 1970 to 19.9% in 1975 and 22.3% in 1980. The share of the Seoul Metropolitan region including a province surrounding the capital city is even more striking 35.5% in 1980.<sup>(9)</sup>

Seoul's population growth rate has decreased since early 70s to about 4% per annum from

(7) Hwang, Myung-Chan, *Regional Development*, Kyung Yung Mun Wha Sa, 1984, pp. 279-281.

(8) *Ibid.*, p. 281.

(9) Ministry of Construction, ROK, *The 2nd 10-Year National Territorial Development Plan*, Vol. 2, 1983, p. 3.

the previous 7-8%, although it is still 2.5% higher than its natural growth rate of 1.5% per annum. As the current population size of Seoul is almost 10 million, annual population growth at 4% is still a substantial burden on the part of Seoul and on the other hand a considerable drain on the part of the communities that lose them. In contrast to the decreasing rate of growth of Seoul, population of Kyunggi Province which surrounds the capital city has grown at an increasing rate since early 70s: its average annual growth rate has increased to 4.04% during the period from 1970 to 1980 from that of 1.9% from 1960 through 1970. Some of the cities (Uichongbu, Anyang, Sungnam and Suwon) of the province has recently increased their population sizes at an annual growth rate of even 10 to 13%.

Broadly speaking, between late 1960s and early 1980s urban population in Korea as a whole has increased at an annual rate of approximately 4.5%. In the process about 10 cities, mostly in the southwest and northeastern regions of the 50 cities have grown at about the rate of natural increase of the country as a whole, while Seoul and its satellite cities in the metropolitan region and the cities including Pusan, the second largest city, along the southeastern seaboard have absorbed the lion's share of it. Two other cities, Taegu and Taejon, in the Seoul-Pusan corridor have grown at a rate higher than the average; and Kwangju, the single dominant urban center in the most lagging southwestern region has grown at a higher rate.

If one may generalize the trend of the past 10 to 15 years, "bi-polarization" seems to be the most appropriate term to describe the swelling urban population at the Seoul metropolitan region and the Pusan crescent of the southwestern seaboard. Except for Kwangju which is the single dominant urban center in the south-western agricultural region and currently of about 800,000 population, the growth of Taegu, the third largest city (pop. 1,900,000) and Taejon, approximately of 690,000 can also be explained in terms of their locations on the axis of the bi-polar agglomerations.

No single cause could have produced such a pattern. But the most dominant factor seems to be the bi-polarized distributions of industrial employments, i.e., of manufacturing sectors. A consultant's report recently submitted to the Economic Planning Board points out the fact that "of all the industrial jobs that were created (in net terms), about 30% went to Seoul and Pusan, 30% to Kyunggi Province, 30% to Kyungnam and Kyung-buk Provinces, and only 10% to the rest of the country." In other words, "45% of the new jobs went to the Seoul metropolitan area, and another 45% to the...Pusan crescent" during

the period from 1970 through 1980.<sup>(10)</sup>

Leaving aside for the moment the question of why such a bi-polarized regional distribution of industrial employments has occurred, this fact seems to explain the reason why interregional migration of population is still continuing in such a scale despite the improving condition of interregional income disparity as above shown in terms of changing coefficient of variation since early 1970s. That is, a plausible argument can be made by this fact that people, especially the young ones, prefer employments in the newly created industrial sectors to the old and traditional means of living in rural communities and smaller cities and therefore, come to Seoul, Pusan and the vicinity.

The obvious reason for such a bi-polarized regional distribution of industrial employments opportunities is no doubt the gravity of market forces to take advantage of the existing agglomeration economies of the two largest urban centers and also, the inertia of the industrial location policy process on the part of the government to go along with the gravity of the market forces. Seoul being the center of almost everything in Korea and Pusan, the largest port closest to Japan and beyond and second largest city in Korea, have offered better infrastructures, more and better manpower concentrations, better financial institutions, better international linkages, and even better urban amenities than any other city in Korea for industrial locations. Furthermore the agglomeration advantages of the two regions have been complemented because of the early connection by an expressway between the two cities.

## 2. Central Planning of Regional Development

In the magnetic field of such a dominantly bipolarized market forces and of the consistently economic efficiency oriented industrial location policy process, institutionalized regional planning process has achieved very little. In Korean context until now regional development is a centrally planned regionalization of national economic development process. In other words it is a top-down investment allocations in consideration of the spatial implications and impacts of industrial development. Except in the case of Saemaul Undong, the rural New Community Movement, very little if any local initiatives and/or participation has been introduced in the central government's regional planning process. Both the First and the Second 10-Year National Territorial Development Plans, which are at least in their

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(10) Economic Planning Board, ROK, Reports of Foreign Consultants: For the Revision of the Fifth Five-Year Economic and Social Development Plan, 1983, p. 119.



nominal functions the main tools of regional development planning of the Korean government, were conceived and prepared by the expert-consultants and technocrats in Seoul. The overall analytical frameworks as well as definitions of development regions and regional development objectives in both Plans were very much geared to the total system's efficiency of the national territory as a whole and in that sense, they are even very much theoretical in their logical construct. Streamlined hierarchical structure of development regions, expected developmental linkages from a few primary growth centers to secondary rural service centers to rural communities, delineation of most of the rural counties as separate settlement zones and the likes make up the systemic integrity of the Plans.

In short these Plans were so well sterilized of politics, market constraints, emotionalism for that matter both at the central governments and the local communities that nothing much has happened so far according to the Plans. Especially during the First 10-Year Plan period most of the major infrastructures and industrial estates development projects were carried out independently of the Plan: the construction of Seoul-Pusan Expressway, so many of rural communities development programs of the Saemaul Undong, Pohang Industrial Complex (one of the world's largest steel mill), Masan Free Trade Zone development, and Gumi Electronics Industries complex, only to name a few, were all planned and developed independently of the First 10-Year Plan.

While the Second 10-Year Plan is now undergoing a rougher course of transformation, as the current government in power, being mindful of increasing demands for democratization of the planning process, has been holding a series of public hearings at as many localities as possible to hear the views of the people as to the portions related to the particular localities of the plan already prepared, very strong voices of complaints and demands for revisions are being raised. Especially strong demands for revisions are being raised from the members of the National Assembly newly elected in the last election. These demands for revisions are mostly from those communities that have been left out of designation of "growth centers," primary or secondary. It appears at the moment that every city and community would like to be designated as "growth centers," expecting to receive some kinds of growth center's development support from the central government.

How far and extensive this newly stimulated politics of the Plan revisions and changes will go is yet to be seen. But even at this moment it seems certain that the systemic integrity and technical nicety alone would no longer sustain the authority of the Plan in the eyes of the people in the affected areas. The future of the 2nd 10-Year Plan as well

as of Korean regional development process as a whole will probably be going through unprecedented structural transformation, depending on the scope and structure of the local governments autonomy expected to come within the next few years.

### 3. Overconcentration of Seoul and Dispersal Measures

Regional planning in its more orthodox form has not attracted much of attention of the society at large and not stirred much activities in the field, either, as stated above. Beginning late 1970s, however, a new perspective has been generated for the Korean regional development. And this new perspective has attracted more attention from the men in power as well as people in the streets: it is the perspective formed on the basis of the perception of impending seriousness of the problems of congestion and overconcentration of Seoul metropolitan region.

As most of the ruling elites of Korea live in Seoul, where they can feel themselves the congestion, pollution and overconcentration, this new perspective could give a real push to regional development. In fact in 1977, then President Park personally directed the 1st Ministry Without Portfolio to prepare a plan to control and disperse the growth of population and concentration of industries. There had been similar attempts since 1964, but they had never seriously been implemented. But this time the President personally ordered to form a special task force at the Ministry whose function by law had nothing to do with urban affairs and/or regional development so that more comprehensive and unbiased measures could be formulated. The outcome within a year was promulgation of "Population Redistribution Plan for the Capital Region" put in force beginning 1978 and to override all existing plans related to the matter.

It was of a thick document containing so many detailed measures to control the growth of Seoul metropolitan. But in gist it consisted of two parts: one part containing a wide range of regulatory measures basically to control further physical growth of Seoul and its surrounding region such as no more permits for new colleges, no more industrial sites developments, no more new government offices, substantially lowered height regulations of the new buildings to be built at the city center, and etc. The other part consisted of provisions of various means of legal and/or economic incentives for those industries, business establishments and educational institutions either to be relocated or expanded at five selected "growth center" cities far away from Seoul.

The regulatory measures imposed upon Seoul region have been rather diligently and

stringently enforced for about two years; but the incentives for those regions where the planners expected to induce the Seoul-bound population and business into have not quite been materialized. Some tax incentives have been offered under the Plan. But somehow it has not been taken advantage of by the larger business community. From today's vantage point, one can surmise the results that the Plan implementation has been relatively more successful in the areas where no direct financial outlays were called for, while on the other hand no significant changes have been brought about in the regions where the incentive measures should have been followed up by more direct investments of capital. One area where legal incentives in the form of relaxation of government permit standards has brought about most notable changes is the educational institutions: tremendous increase of students enrollments in the colleges in these regions.

The net results of the whole process as observable in recent years, though in a short span of time, are increased office space rentals, severer competition in college entrance examinations, much faster growth of population in the satellite cities and stringent environmental and land use controls for industrial sites within Seoul metropolitan region, while nothing of significant changes has happened because of the Plan in those five selected growth centers and people are still coming to Seoul and its vicinity as described earlier. Come 1980, however, such physical constraints as short supply of office spaces and increasing needs of housing lands began to be perceived by the new administration as stifling lid on further growth of national economy as well as on face-lifting efforts of the city for the Olympic. Hence, since early 1980s, while keeping the general character of the original plan unchanged, a new "Capital Region Reorganization Plan" has been formulated, relaxing somewhat the building permit standards and the college students quotas and introducing the case-by-case approval system for new constructions of business establishments, industrial sites, housing estates developments, schools, government offices and other major development projects in the Seoul metropolitan region by the newly organized "Capital Region Reorganization Plan Deliberation Committee" chaired by the Prime Minister.

Perhaps the most significant point, for the purpose of this research, in the Seoul metropolitan region control process is the top policy-makers recognition of the seriousness of problems of environmental pollution as perceived in terms of urban congestion. Establishment of the Office of Environment, introduction of Environment Impact Assessment system, recent completion of 3 million dollar Han River basin pollution investigation and of Ulsan Industrial Complex may be cited as the examples of such a recognition, although such an

awareness has not yet been expanded to the problems of smaller cities.

## **IV. Institutional Framework of Environmental Management**

### **1. Public Nuisance Control Approach**

It was in 1963 that the Public Nuisance Prevention Law was enacted in order to "prevent injuries to public health, damages to living environment from air, water, noise pollutions and...". 1963 was only the second year of the First Five Year Economic Development Plan; and no serious problems of industrial pollution had yet been reported anywhere in the country. As far as the general public was concerned, "environmental quality" was a very alien term. Compared to what it is today, the natural environment of Korea then was indeed of very high quality. It was only in 1967 that a separate section of pollution control administration was established in the Ministry of Health and Social Affairs.

The Law was basically an enabling legislation for the government's police power to prevent and control individual damages by public nuisances of various sources. Although the Law even had provisions for the government's power to order installment and operation of pollution prevention facilities at the polluting sources and further, to stop the polluting operations if not in compliance with the emission standards and required preventive measures, it was rarely invoked except in a very limited number of cases brought up to the attention of the authority by individual complaints.

As was there so little public concern, there was no such thing as a national environmental policy. At the Ministry of Health and Social Affairs only about 15~20 officials manned the daily routines of administering the Public Nuisance Prevention Law until 1977 when the section was elevated to the level of Bureau. Even until 1979 the national government's budget for pollution control or environmental protection was no more than 10 million dollars: the figure started with \$360,000 in 1974 to \$5 million in 1978 and doubled in 1979, a year before the Office of Environment was instituted. At the local government's level the situation was worse: at the level of provincial government only a sub-section in charge of public health with a few persons was responsible for executing the directives from the central government.

As far as public awareness was concerned, early '70s was the turning point. At the beginning it was not of widespread phenomenon but in a limited circle of better educated

population of larger cities who were more exposed to foreign information. Mass media, however, played much greater role during this early period in sensitizing the general public to the emerging problems of environmental deterioration. At the beginning they, too, seemed to have been very much influenced by the information from Western industrialized countries; but gradually they began to look into the problems in the country and report them to the public.

The most notable case in this respect was perhaps the first major court battle brought by a ginseng farmer against a chemical production factory for recovery of damages on the farm by alleged toxic pollutants discharge from the factory. Although the Korean Supreme Court then still stuck to the traditional principle of tort law and thereby, ruled that the burden of proof of causality between the damages and the tortious act should rest on the plaintiff as in any other cases involving tort damages,<sup>(11)</sup> reports of similar cases, most property damages in the farms, contributed a great deal to raising public awareness. The figures in the the following table which shows the government's responses also attest the changing attitudes during the '70s.

Environmental Enforcement Actions

Year	Total	Inspection of pollutant discharge			Action taken				
		Total	In Compliance with standards	Violation of standards	Total	Order to improve	Suspension of operation	Order to relocate	License cancellation
1972	14,813	7,749	7,066	683	1,806	1,058	28	—	—
1973	15,005	13,531	12,263	1,273	1,358	1,201	80	69	8
1974	14,786	9,382	8,144	1,238	1,436	1,270	118	11	4
1975	13,638	8,291	6,670	1,621	2,283	2,016	59	82	126
1976	14,764	10,154	7,977	2,177	2,336	2,018	82	163	73
1977	16,116	19,243	15,467	3,776	4,408	3,879	143	252	134
1978	15,772	16,681	12,877	3,804	4,552	3,838	235	386	93
1979	18,901	18,573	15,020	3,553	5,081	3,217	439	618	807

Source: Office of Environment, *Environmental Conservation in Korea*, 1983, p. 113

It was against such a background of rising public awareness that serious criticisms of existing institutional set-up of environmental protection including the Public Nuisance Prevention Law began to be heard. The gist of criticisms and of proposals for revision were basically two fold: the one was to the effect that the Law did not provide for a comprehensive nation-wide and/or area-wide environmental standards by which an integ-

(11) Supreme Court 2nd Division, 73Da 919 Nov. 27, 1973.

rating concept of environmental quality and an overall environmental policy could be established and the other was related to the leniency of the penalties against violators. The latter was to raise the point that the penalties were in fact much cheaper than the private gains by polluting the public environment and demanding that the "polluters should pay" to clean up the environment.

## 2. Environmental Preservation Approach

The outcome of rising public awareness and recognition by the government of the needs to respond was first to enact a new law, "Environmental Preservation Law," to replace the old one in 1977, insert in the new Constitution a provision for the right to environmental quality in 1980 and then, finally, establishment of the Office of Environment at the central government under the general supervision of the Ministry of Health and Social Affairs in 1980.

The Constitutional provision for the basic right to environmental quality is more of a symbolic nature; but promulgation of the new Environmental Preservation Law and establishment of the Office of Environment was a very significant step toward a new institutional framework. By the new law, Environmental Impact Assessment system was adopted for major public works projects; city-wide and/or regional ambient air quality, water quality and other environmental standards are to be established and monitored; the "polluters pay" principle has been adopted; and much severer penalties in terms of both amount of fines and of imprisonment against violations of the law have been put in force.

More significant development has been with the 5th Five Year Socio-Economic Development Plan(1982~1986). In preparation of this 5th Plan, the newly established Office of Environment had been asked by the economic planners for the first time to submit basic environmental policy guidelines that were to be incorporated in the Plan and thereby, considered for budgetary allocations. The policy guidelines as prepared by the Office are roughly as follows:<sup>(12)</sup>

- 1) Preparation of a long-term comprehensive environmental conservation plan; and a long-term master plan for four major river basins in Korea;
- 2) Increase of environmental monitoring stations and development of early warning system;
- 3) Improvement of environmental impact assessment system and methods in order to

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(12) Office of Environment, ROK, Environmental Conservation, 1984, pp.179-182.

include wider variety of development projects; and

4) Improvement of pollution abatement technology and environmental preservation research capabilities.

Most of these policy measures have been incorporated in the Fifth Plan; and basic surveys of the Han River for a long-term master plan have already been completed and two more rivers investigation projects are currently undergoing. Law enforcement on the violations of the emission standards as provided by the law has gotten tougher. Yet there are still substantial number of complaints about unattended violations reported in mass media; and the monitoring stations for both air and water quality are only 434 nation-wide as of 1982 and among them only 125 are automatic. There is a plan to increase the number of monitoring stations within the next few years. But more important area of improvement for the monitoring system should be to establish some kind of automatic linkage between monitoring work and pollution control measures and its administration. For the near future, however, most of the local governments, except perhaps Seoul city, are not adequately equipped both in terms of manpower and technical know-how to manage such sophisticated system.

The operation of the "pollutors pay" principle has also been somewhat compromised. As rational criteria by which the amount of costs to be born by individual pollutors is to be calculated, especially in an industrial complex, have not been worked out, it is now left to a sort of private bargaining and mediation process between the pollutors and the claimants of damages when such needs arise.

On the other hand, the Environmental Impact Assessment provision of the new Law has most dutifully been observed since its inception. Although the scope of the Impact Assessment is now limited to only ten projects by government agencies and/or government supported programs, the Office of Environment exerted its authority most strongly through this system to control environmental impacts of development programs by other agencies. The problem, however, with this institution is the lack of sophisticated technical know-how of the actual assessment work in the field and also, in many cases political intervention for important projects in disregard of the impact assessments. As this system is the single most important tool for possible integrative planning of regional development and environmental protection, the details of the operational process of EIA will further be discussed in our treatment of the specific development project.

## V. Iri Industrial Estate Development

### 1. Profile of the Region

Selection of this case for this study is based on two considerations, namely, the planning and development of this industrial estate has been undertaken since the new Environmental Preservation Law enacted and further, this industrial estate is located in the middle of a region that provides one of the most fertile rice fields in Korea. Under the new Environmental Preservation Law, the plan for the Iri Industrial Estate Development was required to be assessed of its environmental impacts; and a technical consulting firm in Seoul on contract with Iri Regional Office of Land Management(a branch of the Ministry of Construction to supervise land development activities in the region) prepared and submitted the Environmental Impact Statement to the Office of Environment in August of 1983. Development of the site has begun since 1984 to be completed by 1986.

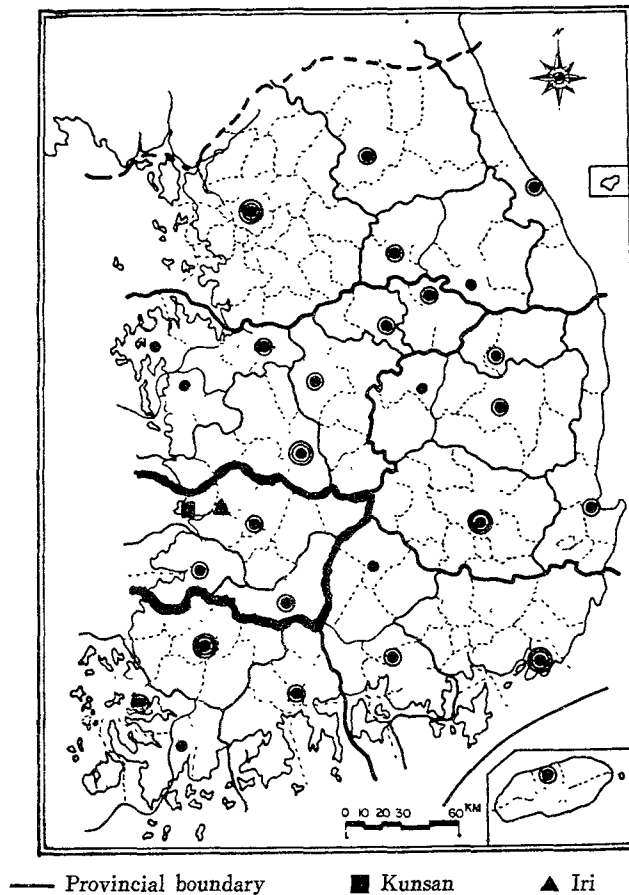
Iri is a city in North Cholla Province (Cholla Buk-Do) approximately 200Km southwest of Seoul. As noted earlier, the southwestern corner of Korea(North and South Cholla provinces) has been and still is the breadbasket of the country. More than 60% of rice production come from these two provinces.

The population of the North Cholla Province is 2,280,000 as of 1980, decreasing at the average annual rate of 1.4% since 1975. The share of the primary industry in the gross regional product has changed from 56% in 1970 to 42% in 1978. But compared to changes of the national average figures in the same period from 30% to 19%, the Province is still very much agricultural economy. The share of secondary industry in the GRP has steadily grown at an average annual rate of approximately 11%. But this is also much less than the national average of 18%. As of 1978 the Province's secondary industry holds about 18% share in the Gross Regional Product, while the national average is about 30%.

The city of Iri in such a surrounding is the second largest one after Chunju, which is the capital city of the province and has population of about 200,000. Chunju, Iri, and Kunsan, a port city open to the Yellow Sea form a sort of urban axis of the province, both Chunju and Kunsan being within the radius of about 30 minutes driving distance of Iri. Kunsan is smaller in size than the other two cities, but traditionally it has been the main exit of transportation of grains and other farm product of the province. The Kunsan port is of relatively limited capacity as an industrial port. But there is a plan in the



## North Cholla Province and Iri



national government to expand and upgrade its functions for the possible future linkage with the mainland China.

While the province as a whole has been losing population as noted above, the city of Iri has been gaining at the average annual rate of 2.3% since 1962.<sup>(13)</sup> During the 1960s there was an increase of population in absolute number, but it was mostly due to the high rate of natural increase (approx. 2.6% per annum). However, since 1970 the rate of total population increase has been exceeding the declining annual natural growth rate: the average annual net gain has been at the rate of almost 1%. Especially since 1975 the average annual population growth rate has jumped to 3.5%, almost 2% of which is observed to be of social increase contributed by immigration from the surrounding rural communities. This recent trend of population growth of the city is

(13) The City of Iri, Long-Term Master Plan of the City of Iri, 1980, p.7.

attributed to the new job opportunities created by the first Iri Industrial Estate development as completed in the mid 70s.<sup>(14)</sup>

The physical size of the city is approximately 48 square Km, in which about 23% of employments are in agriculture, about 30% in the manufacturing sectors of mostly small and medium industries, and the rest in various kinds of services. The ratio of employments to the total population is about 37%. The city's per capita income is about 78% of the national average which is estimated to be about \$1,900 as of the end of 1984.<sup>(15)</sup>

Since the 1st Iri Industrial Estate was completed in 1974 in the area of approximately 280,000 pyung,<sup>(16)</sup> about 90 new firms have moved their factories in both from the city and outside. They are mostly small and medium industries consisting mainly of food-processing, light metal and machineries, textiles, and paper-mills. (There are even 13 foreign direct or joint venture factories in this Estate) The share of industrial product of this Estate in the total industrial product of Iri is almost 72%;<sup>(17)</sup> and in this sense it has indeed brought about a structural change in the city's industries. Subsequently the central government designated an area of about 150,000 pyung, about 4Km away from the center of the city, as "Local Industrial Development Law" in 1978. And this is the 2nd Iri Industrial Estate project that is the subject of this study.

## 2. Plans for Development

The main objective of the national government's regional development policy for the North Cholla Province is to diversify the industrial structure.<sup>(18)</sup> In other words, more industries of domestic market oriented consumer goods manufacturing are planned to be introduced into the Province that is still predominantly agricultural.

In terms of spatial reorganization for the regional development objective, the 2nd 10-Year Plan has chosen Chunju-Iri-Kunsan as the industrial development axis and Chunju as the "growth center" of secondary order. The Province as a whole is planned as a subregion of a larger development region which includes the South Cholla Province as well and its primary order "growth center" being Kwangju, the capital of the latter Province.

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(14) Ibid., p.7.

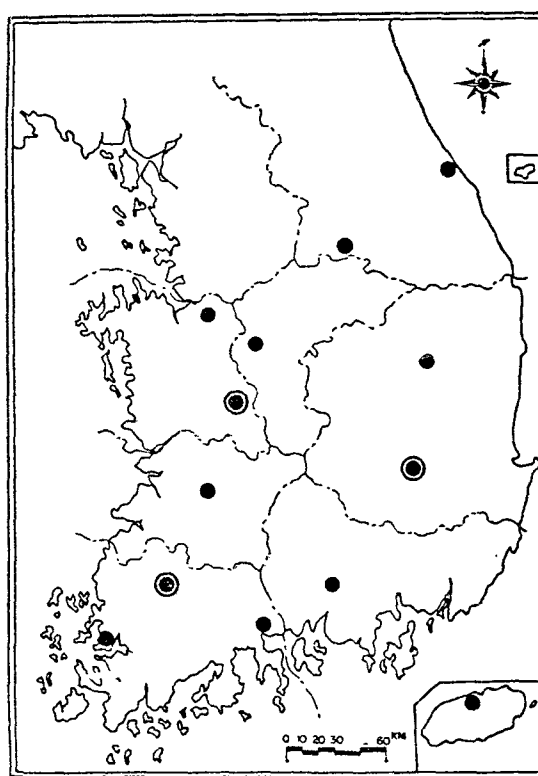
(15) Ibid., pp.7-9.

(16) 0.924km<sup>2</sup>

(17) The City of Iri, op. cit., p.101.

(18) Ministry of Construction, op. cit., pp.36-37.

## Development regions and Growth Centers



⊙ primary growth centers

● secondary growth centers

In order to support the industrialization process, some major social overhead costs investments are also planned for the Province as shown in the following map. But despite all these changes as planned, the relative weight of the Province in the national development process for the next 10 years is projected still very modest: e.g., population growth at only 1% per year, share of GRP in GNP increasing to 4.7% from the current 4.4%, and share of secondary industries product in GRP to 3.5% in 1991 from 2.4%. Apparently from the point of view of the regional planners at the central government, the Province is not seen as a big potential for economic growth.

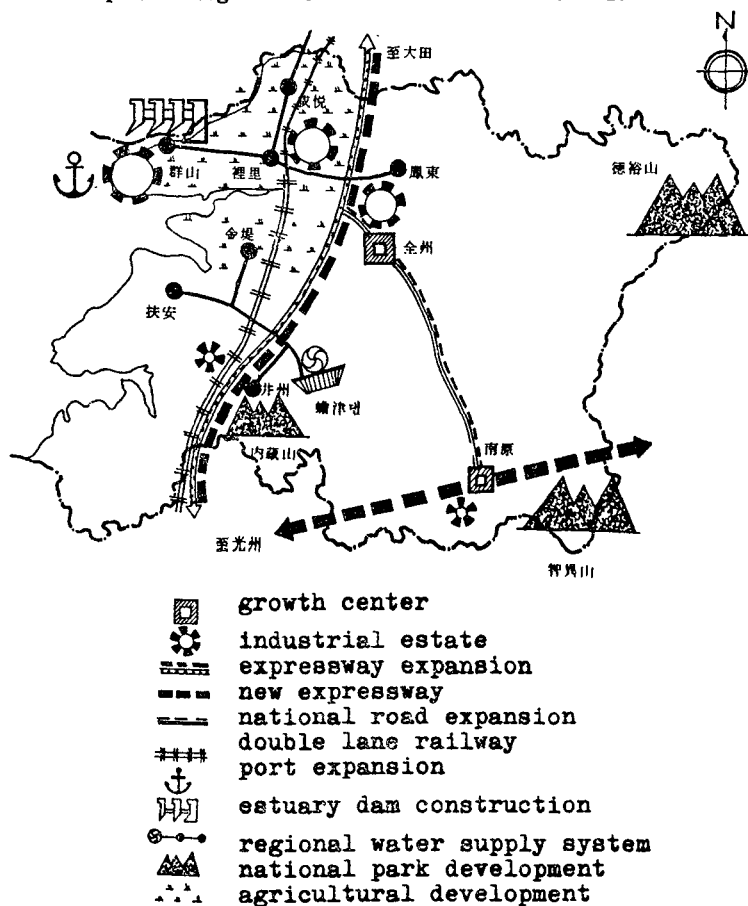
Constrained by the national government's plan, the Province has prepared its own development plan for the period of 1982 through 1991. In this plan, too, the main concern is for changes in the industrial structure from predominantly agricultural to a degree of industrialization. Unlike the national government plan, however, the Provincial Plan is a little more specific on "parallel development of industry and agriculture" for the future in

consideration of its comparative advantages in agriculture.<sup>(19)</sup> Hence, the plan specifically states that "conservation of natural environment" is to be of a high priority objective of the development process.

As for the spatial reorganization, the Provincial Plan proposes its own efforts for the coastal region development, while accepting the idea of industrial development axis of Chunju-Iri-Kunsan as proposed by the national government.<sup>(20)</sup> The rationale for this coastal region development is that the area is the poorest part of the Province and therefore, more investments are called for.

Finally there is the Master Plan of the city of Iri itself for the period of 1982 through

#### Development Programs for the Province in the 2nd 10-Year Plan

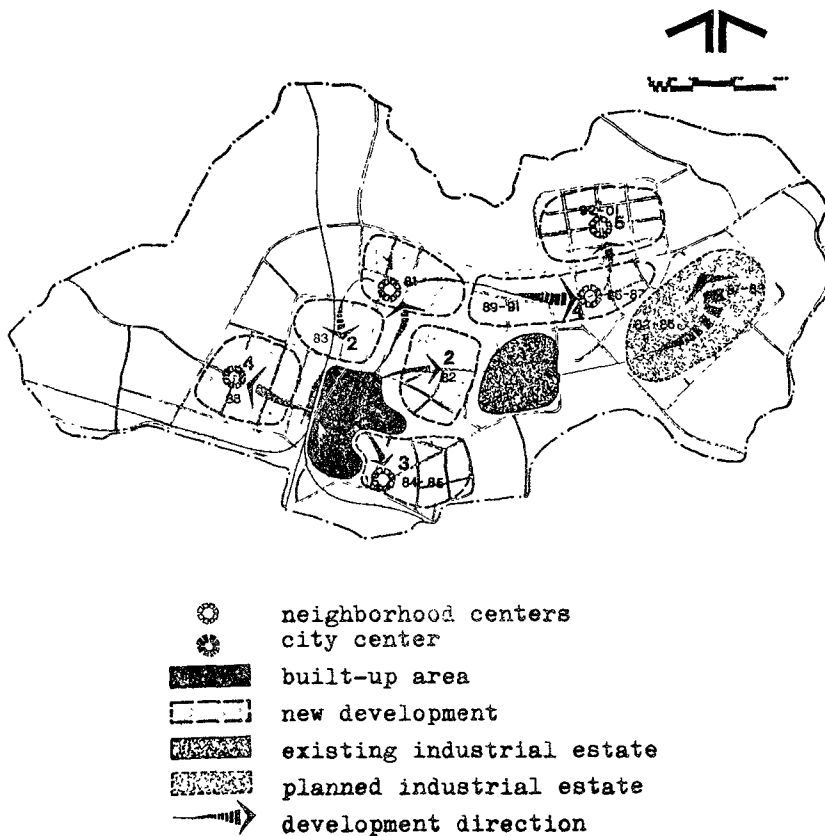


Source: The North Cholla Province Development Plan, 1982, p. 18

(19) The Province of North Cholla, The Comprehensive Development Plan of the North Cholla Province, 1981, pp. 47-48.

(20) Ministry of Construction, op cit., p. 54.

## Conceptual Plan of Development of Iri



Source: The Iri City Master Plan, 1980, p. 48

1991. At the top of the developmental objectives the City Plan states that Iri is to be developed "as a regional service center in the wider urban realm of Chunju-Iri-Kunsan development axis."<sup>(21)</sup> As for industrial development it merely accepts the upper level plans in its city-wide zoning plan.

In order to become the "regional service center," it proposes to improve commerce and trade functions and higher education. Otherwise, as any other Korean cities Master Plans, it consists basically of land use and zoning maps, road and other public utilities network, urban park system, and the likes. A notable feature of the Plan for this study is its proposal for a sort of a new town, though in a limited scale, very close to the 2nd Industrial Estate as shown in above conceptual map. The rationale is not very clear, but it seems to imply that the area will become a new sub-center of the city.

(21) The City of Iri, Report of the Expansion Master Plan for Iri Industrial Estate, 1978, p. 17.

### 3. Environmental Considerations in Industrial Location

Basically two sets of law govern process of industrial location decisions and environmental considerations in Korea: namely, the Local Industrial Development Law promulgated in 1970 and the Environmental Preservation Law of 1977 as amended twice since its inception. The former is to provide for the authority of the Minister of Construction to "promote appropriate regional distributions of industries" and "...thereby contribute to equitable development of national economy." (Article 1) This authority consists mainly of power to designate "Local Industrial Development Promotion Zone" by the Minister's own discretion or upon request from the Governor of a province, of provision for tax exemption and/or reductions for the firms that operate factories within the zone, and lastly of power to use the methods of compulsory acquisition of the lands in the zone for industrial estate development. As far as the statute itself is concerned, it consists of only 11 Articles and no references to environmental considerations in making the locational decision.

However, in its Executive Orders to implement the Law, there are two provisions for environmental considerations. That is, Article 7 of the Executive Orders, in providing for submission of a Master Plan for industrial estate development in applying for the Minister's approval for designation of the "Industrial Development Promotion Zone", requires that pollution management program be included in the Master Plan. This provision is further augmented by Article 11 which requires individual firms to submit application to the provincial governor for admission into the zone that includes "methods of pollution controls."

In reviewing the Master Plan at the Ministry of Construction, a Local Industrial Development Deliberation Committee is to be formed (Articles 13 and 14) including the Vice-Minister of Health and Social Affairs which supervises the Office of Environment. This is a sort of procedural safeguard for the environmental considerations. However, both at the central government and the provincial government, since there have been rarely competitions for either designation of zone or admissions into the estate, there has never been a refusal of designation or admission on the ground of insufficiency of environmental protection measures. And furthermore, since the reviews are done on the basis of plans for pollution abatement measures and equipments, it always turns into an issue of ex post facto policing of actual installment and operation of the measures and equipments as proposed to be installed. After all, the main purpose of this particular Law is to induce industries into the designated area by every means possible and therefore, technically feasible plan for

pollution control suffices as far as the environmental considerations are concerned.

On the other hand, the Environmental Preservation Law gives authority to the Administrator of the Office of Environment to request changes in a selected categories of development programs and/or projects to the agencies in charge on the basis of Environmental Impacts Statements on the programs or projects concerned. The Law also provides that, when such request are made by the Office of Environment, the requested agencies "must make corresponding measures" as to the original plan of development. (Executive Orders Article 4~3) Such a strong authority has been recently given to the Office of Environment by 1983 amendments of the Executive Orders to implement the Law.

The environmental impact assessment is required by the Law (Article 5(1)) of industrial location decisions and/or industrial estate developments. But the Executive Orders of the Law further provides that the executing agency of the particular industrial estate development project must "submit the EIS before applying for approval of the Master Plan" by the Ministry of Construction "in accordance with Article 4(1) of the Local Industrial Development Law." This means that the EIS is to be reviewed by the Office of Environment before the locational decision process begins at the Ministry of Construction. This early timing of EIS review has also recently been added to the Executive Orders in order to strengthen the power of the Office of Environment for environmental considerations in development programs.

In reality, however, the early timing is making the assessment work technically more difficult, since the assessment has to be made on the basis of rather general outline of the development project to be undertaken. Hence, the timing is a sort of an issue of trade-off between a longer preventive time and more concrete impact assessments.

Since 1981 when the EIA system was put in force, there have been total of 81 cases of EIS submitted to the Office of Environment in 10 categories of development programs as shown in the following table. Yet there has never been a case where a major changes of original plan is requested by the Office to the executing agency because of environmental impacts. In the cases where there are adverse impacts predicted by EIA, invariably only abatement measures have been recommended to the executing agency.

Cases of Environmental Impact assessment

Year		1981	1982	1983	1984.9
Total	81	1	10	37	33
urban developments	5			2	3
indus. locations	9		3	3	3
energy developts.	3		1	2	
port construction	3		3		
water res. devlpts	5	1	1	3	
river basin reclm.	3			2	1
housing estates	20		2	9	9
tourist sites	3			2	1
power lines	29			14	15
airport construct.	1				1

Source: Office of Environment, *Environmental Conservation*, 1984, p.128

#### 4. The Case of Iri's 2nd Industrial Estate

The decision to introduce 2nd industrial estate into Iri area was made by the central government as a measure for regional development of the North Cholla province as described above. But the specific location and the size of it has been jointly decided by the city of Iri and the provincial government in accordance with the city planning procedure. Under the Korean City Planning Law the mayors and/or county chiefs have the authority to "prepare" their city or town plans, but they have to be approved by the provincial governments and finally, the Minister of Construction has the authority to "decide" upon the plan with the consent of the Central City Planning Council composed of several outside "experts" and some director generals of related bureaus of the central government.

The specific location of the 2nd Industrial Estate was selected 4 Km east of the city center and 1 Km east of the existing industrial estate mainly because the east side of the city offers relatively less topographical obstacles for such development. And furthermore, the city planners saw an opportunity in the eastern sector not only for industrial sites but also rather vast area for future expansion of the city's residential space. In its 1980 Master Plan the city newly zoned an area of about one third of the existing built-up area as residential and industrial. The 2nd Industrial Estate which are being developed is only a part of the new Industrial Zone as planned by the 1980 Mester Plan of the city. The land as currently being purchased for the industrial estate developmet consists of about 75% farming uses; about 19% hills with some forestry, and the rest of housing, streets and small factories.

The official development agency of this industrial estate is the city government of Iri;



and the actual development work is undertaken by the Korea Land Development Corporation, which is a government funded public corporation for housing and industrial estates development, land banking, and other land management duties under the supervision of the Ministry of Construction. KLDC is now in the process of purchasing the land and construction work is expected to begin from September of this year. When KLDC complete the site and services construction work of the Estate, it will sell individual parcels to private firms that want to build factories there at a price to recoup the development costs. The management responsibility of the Estate as a whole is going to be transferred to the city government when the construction work is completed.

On the other hand the Environmental Impact Statement on the 2nd Industrial Estate was contracted out to a consulting firm by the Iri Regional Office of the National Land Management as the regional branch of the Ministry of Construction, which has the authority to decide upon designation of the "Local Industrial Development Promotion Zone." and then submitted to the Office of Environment. The EIS as submitted to the Office covers a wide range of environmental impacts including ecological, socio-economic, and scenic. The main part is, however, of ecological impacts and their effects on human health.

In contrast to such a wide coverage, the content lacks concreteness. With respect to the impacts assessment methods the technical capability of the consulting firm may very well be deemed questionable. But more fundamental problem seems to lie in the procedure itself as briefly mentioned earlier. As the impacts assessment was done on the basis of a very general outline of the development plan, namely, the Master Plan of the Estate Development as submitted to the Ministry of Construction in application for the Industrial Development Promotion Zone designation, not much information as to the future conditions of the Estate was available. For instance, the Master Plan proposes that food processing, tobacco manufacturing, wood work, textiles, leather, paper mills, metal, machinery, chemical, and rubber industries are to be invited into the Estate. But at this stage these lists are only a sort of statement of intention of the planners; and hence, there are no information available for the impacts assessors on either the sizes of factories or even how many of each of the industries expected to come in.

As the private firm's locational decisions are very much determined by market forces and individual profit motivations and also, as so many of local industrial estates are now competing with one another to induce as many industries as possible in Korea today, the lists of industries as planned to be induced are practically meaningless unless it is of the

government's special investment program. Under such a circumstance, the more relevant issue for EIA should be whether industrial estate of any kind be located at a particular area. But then, as the Environmental Preservation Law does not go so far as to give a veto power to the Office of Environment on industrial location, EIS can merely suggest "modifications and/or reinforcements" of the original plan of development. (Article 5 of the Law and Article 4-3 of the Executive Orders)

In its conclusion and recommendations the Iri EIS notes that "no irreversible or unmanageable adverse impacts are foreseen," "except in the case of water pollution in the Man-Kyung River which is the sixth longest river in Korea and is already polluted to the level of BOD 35.8~41.6 in downstream, threatening the lives of most of its fish population." The recommendation, however, is merely to take special care for abatement measures within the Estate; and no modifications or reinforcements of the original plan has been proposed as most of the other EISs of similar projects. Hence, the 2nd Industrial Estate Development Project is now being carried out as originally planned without any change because of environmental consideration and expected to be opened for incoming factories by 1987.

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